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10/599,172

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Jeon-keun Oh

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MCDERMOTT WILL & EMERY LLP  
600 13TH STREET, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER

SCULLY, STEVEN M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/14/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/599,172             | OH ET AL.           |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Steven Scully          | 1795                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,6-8,14 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,6-8,14 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/27/2010</u> .   | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 1795

**HIGH POWER LITHIUM UNIT CELL AND HIGH POWER LITHIUM BATTERY PACK  
HAVING THE SAME**

Examiner: Scully S.N.: 10/599,172 Art Unit: 1795

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 23, 2010 has been entered. Claims 1 and 6-8 have been amended and claim 15 is newly added. Accordingly, claims 1, 6-8, 14 and 15 are pending in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 1, 6-8, 14 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

Art Unit: 1795

convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, independent claims 1 and 15 require "said plurality of cathode/anode plate connecting parts in direct electrical contact with each other along substantially entire surfaces thereof". The Examiner references the instant specification, page 7, line 25 through page 8, line 17, which does not provide any indication that the connecting parts are in direct contact along substantially entire surfaces thereof. Appropriate correction is required.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 6-8, 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, claims 1 and 15 recite "along substantially an entire exposed surface thereof", "along substantially entire surfaces thereof", at lines 9, 12, 14 and 16 of claim 1 and lines 9, 11, 14 and 16 of claim 15. The term "substantially" is indefinite, and does not provide one of ordinary skill in the art any indication what is required for interpreting the term. Further, the specification provides no indication as to how to interpret the term. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

6. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Hisamitsu et al. (US2004/0038124).

With respect to claim 1, Hisamitsu et al. disclose a laminate cell, such as a lithium ion secondary battery, having a power generating element formed by sequentially stacking positive and negative electrode plates while interposing separators therebetween; a positive tab connected to the positive electrode plates; a negative tab connected to the negative electrode plates. The tabs are drawn outward from end edges of long sides of the cell package. See abstract; [0041]. This is done so that the internal resistance of the cell is reduced by having a shorter conductive path to the terminal. See [0038]. The positive and negative tabs 5 and 7 are connected to the plurality of positive and negative leads 4 and 6, respectively, where the plurality of positive and negative leads 4 and 6 are in direct electrical contact with each other. Hisamitsu et al. further disclose anode and cathode rectangular plates extending from the long sides of the cell package such that over half and less than all of the tabs extend from the sides. See Figure 2.

With respect to claim 6, Hisamitsu et al. disclose the terminals are welded to the collector plates. See [0031].

### ***Claim Rejections - 35 USC § 103***

7. Claim rejections of claims 1 and 6 under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US2003/0054239) in view of Hisamitsu et al. (US2004/0038124) are withdrawn in light of the Amendment.

Art Unit: 1795

8. Claim rejection of claim 7 under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US2003/0054239) in view of Hisamitsu et al. (US2004/0038124) and Kelley et al. (US2004/0191632) is withdrawn in light of the Amendment.

9. Claim rejections of claims 7 and 8 under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US2003/0054239) in view of Hisamitsu et al. (US2004/0038124) and Brodd (US5,498,490) are withdrawn in light of the Amendment.

10. Claim rejection of claim 14 under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US2003/0054239) in view of Hisamitsu et al. (US2004/0038124), Brodd (US5,498,490) and Miyazaki (JP2004-027134) is withdrawn in light of the Amendment.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (US2003/0054239) in view of Hisamitsu et al. (US2004/0038124).

With respect to claim 1, Watanabe et al. disclose a lithium unit cell comprising an anode and a cathode. A cathode and an anode terminal are each connected to the unit cells. See [0046]; Figures 3 and 10. Further, Watanabe et al. disclose a collector and a collector weld portion. See [0007]. Watanabe et al. do not explicitly state that a separation film is inserted between the anode and cathode place for providing electric insulation. However, it is the position of the examiner that a separator is inherent in the invention of Watanabe et al. because they disclose a "unit cell" which by definition

Art Unit: 1795

comprises an anode, a cathode, an anode current collector, a cathode current collector and a separator. The separator is required in order for the operation of a battery to occur because it prevents short circuits which would occur otherwise leading to no energy output. Inherency is not established by probabilities or possibilities. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

Watanabe et al. disclose the terminals to be protruding from a single short side. See Figure 9A. Thus, Watanabe et al. are silent regarding the terminals protruding from either of two long sides of four sides of the rectangular anode/cathode plates. Hisamitsu et al. disclose a laminate cell having a power generating element formed by sequentially stacking positive and negative electrode plates while interposing separators therebetween; a positive tab connected to the positive electrode plates; a negative tab connected to the negative electrode plates. The tabs are drawn outward from end edges of long sides of the cell package. See abstract. This is done so that the internal resistance of the cell is reduced by having a shorter conductive path to the terminal. See [0038]. The positive and negative tabs 5 and 7 are connected to the plurality of positive and negative leads 4 and 6, respectively, where the plurality of positive and negative leads 4 and 6 are in direct electrical contact with each other. Hisamitsu et al. further disclose anode and cathode rectangular plates extending from the long sides of the cell package such that over half and less than all of the tabs extend from the sides. See Figure 2. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to extend the terminals from a long edge of the battery because Hisamitsu et al. teach that it reduces the internal resistance of the cell. Watanabe et al.

Art Unit: 1795

disclose tabs which are smaller than half the length of the side and that can be approximated as about 1/4 of the length. See Figures 9 and 10. Further, it is the position of the examiner that the specification does not provide evidence for the criticality of the width of the terminals.

12. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hisamitsu et al. (US2004/0038124) as applied to claims 1 and 6 above, and further in view of Kelley et al. (US2004/0191632).

With respect to claim 7, Hisamitsu et al. are silent regarding a coating on the cathode plate connecting part and the anode plate connecting part. Kelley et al. disclose a battery having a tab (21) formed on a current collector (20) wherein the tab is coated with a conductive material having a metal that is more conductive than the current collector to provide structural support for the tab (21) and create a suitable electrical connection capable of handling high currents. See [0025]. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a coated layer between the current collector and the tab because Kelley et al. disclose it to create a suitable electrical connection capable of handling high currents.

13. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hisamitsu et al. (US2004/0038124) as applied to claims 1 and 6 above, and further in view of Brodd (US5,498,490).



With respect to claims 7 and 8, Hisamitsu et al. are silent regarding an adhesive being used to connect the terminals to the current collectors. Brodd discloses a battery having current collectors which are adhered to electrodes (i.e. terminals) using a resistive adhesive layer (41) such as a conductive plastic. By doing so, the thickness and resistivity of the adhesive layer are controlled so as to introduce into the current flow path of each cell a controlled resistance. See column 3, lines 39-58. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an adhesive coating between the current collector and the terminal because Brodd teaches it to allow for the value of the resistance to be controlled.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hisamitsu et al. (US2004/0038124) and Brodd (US5,498,490) as applied to claims 7 and 8 above, and further in view of Miyazaki (JP2004-027134).

With respect to claim 14, Hisamitsu et al. and Brodd do not disclose the highly conductive material is at least one of a gold nanotube or a carbon nanotube.

Miyazaki discloses an electrically conductive adhesive produced by mixing electrically conductive particles consisting of carbon nanotubes with a binder resin to provide an electrically conductive adhesive having improved conductivity and retention of adhesive strength. See abstract. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the adhesive of Miyazaki in the battery of Hisamitsu et al. and Brodd because Miyazaki teaches it provides improved conductivity and retention of adhesive strength.

***Response to Arguments***

15. Applicant's arguments filed February 23, 2010 have been fully considered but they are not persuasive. Applicant argues:

*a) Hisamitsu fails to disclose and/or suggest a unit cell comprising a cathode/anode terminal electrically connected to a plurality of cathode/anode plate connecting parts along substantially an entire exposed surface thereof.*

Initially, it is the position of the Examiner that arguments regarding Watanabe et al. are remedied by Hisamitsu et al.

The Examiner respectfully disagrees. It is the position of the Examiner that the leads 4, 6 are electrically connected to the terminals 5, 7 along substantially an entire exposed surface thereof. Particularly, Figure 3 depicts an exposed surface of the leads 5, 7 on the inner portion of the battery that is substantially connected to the leads 4, 6. It is further noted that the term "substantially" is indefinite, and the specification provides no indication to one of ordinary skill in the art what is required to meet or not meet the claim.

*b) Hisamitsu also fails to disclose and/or suggest a unit cell comprising a plurality of cathode/anode plate connecting parts in direct electrical contact with each other along substantially entire surfaces thereof.*

The Examiner respectfully disagrees. Firstly, it is the position of the Examiner that the specification provides no support for the newly recited claim limitation.

Secondly, again, it is further noted that the term "substantially" is indefinite, and the

Art Unit: 1795

specification provides no indication to one of ordinary skill in the art what is required to meet or not meet the claim. Lastly, the leads 4, 6 are in direct electrical contact with each other along entire surfaces thereof, because the leads touch and are thus in electrical contact. Adjacent leads are in direct electrical contact, even where they are not directly touching, because there is no interposing layer through which the electricity would have to travel. Further, a substantial portion of the leads 4, 6 are in direct contact along the surface of the terminals 5, 7. Thus, it is the position of the Examiner that the claim limitations are met.

***Contact/Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Scully whose telephone number is (571)270-5267. The examiner can normally be reached on Monday to Friday 7:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. S./

Examiner, Art Unit 1795

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795